

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT NO. 3536
THE PENNSYLVANIA RAILROAD COMPANY
IN RE ACCIDENT
NEAR BALTIMORE, MD., ON
OCTOBER 17, 1953

SUMMARY

Date: October 17, 1953
Railroad: Pennsylvania
Location: Baltimore, Md.
Kind of accident: Derailment
Train involved: Passenger
Train number: 143
Engine number: Electric locomotive 4911
Consist: 14 cars
Speed: 60 m.p.h.
Operation: Signal indications
Tracks: Four; 2° curve; vertical curve
Weather: Clear
Time: 11:53 p. m.
Casualties: 75 injured
Cause: Obstruction on track

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3536

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS
UNDER THE ACCIDENT REPORTS ACT OF MAY 6, 1910.

THE PENNSYLVANIA RAILROAD COMPANY

November 9, 1953

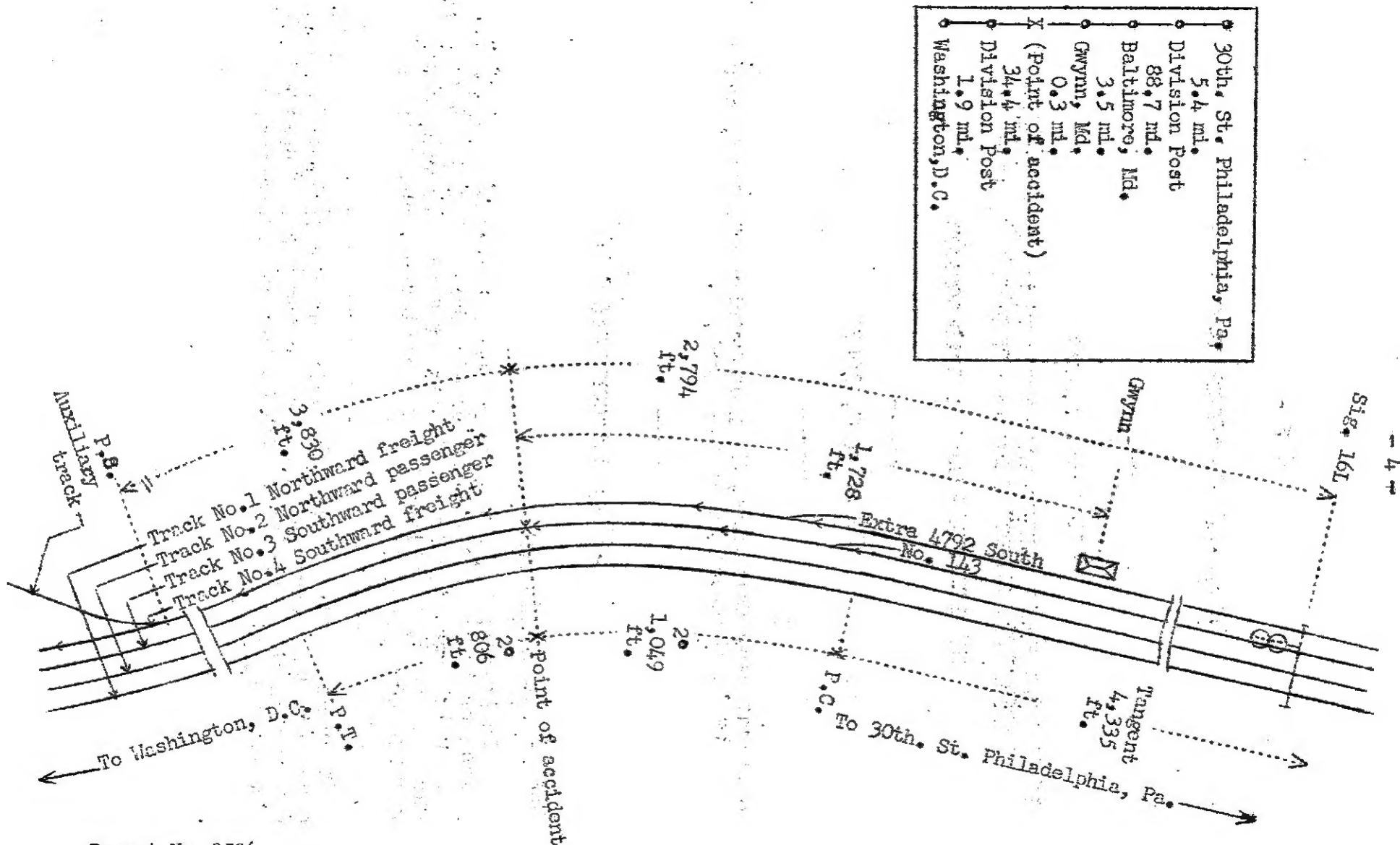
Accident near Baltimore, Md., on October 17, 1953, caused
by an obstruction on the track.

REPORT OF THE COMMISSION¹

CLARKE, Commissioner:

On October 17, 1953, there was a derailment of a passenger train on the Pennsylvania Railroad near Baltimore, Md., which resulted in the injury of 61 passengers, 6 dining-car employees, 2 Pullman Company employees, and 6 train-service employees.

¹ Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Clarke for consideration and disposition.



Report No. 3536
 Pennsylvania Railroad
 Baltimore, Md.
 October 17, 1953

Location of Accident and Method of Operation

This accident occurred on that part of the Maryland Division extending between Division Post, near 30th St., Philadelphia, Pa., and Division Post, near Washington, D. C., 126.9 miles. In the vicinity of the point of accident this is a four-track line, over which trains moving with the current of traffic are operated by automatic block-signal and cab-signal indications. A catenary system is provided for the electric propulsion of trains. From east to west the main tracks are designated as No. 1, northward freight; No. 2, northward passenger; No. 3, southward passenger; and No. 4, southward freight. The accident occurred on track No. 3 at a point 97.9 miles south of 30th St., Philadelphia, and 3.8 miles south of the station at Baltimore. From the north there are, in succession, a tangent 4,335 feet in length and a 2° curve to the left 1,049 feet to the point of accident and 806 feet southward. From the north there are, in succession, a 1.10-percent ascending grade 1,750 feet in length, a vertical curve 650 feet to the point of accident and 250 feet southward, and a 0.77-percent descending grade 300 feet.

The track structure consists of 152-pound rail, 39 feet in length, laid new in 1944 on an average of 22 treated ties to the rail length. It is fully tieplated with double-shoulder canted tieplates, spiked with three rail-holding spikes and two anchor spikes per tieplate, and is provided with 6-hole 38-1/2-inch joint bars and an average of 10 rail anchors per rail. It is ballasted with crushed stone to a depth of 18 inches below the bottoms of the ties. At the point of accident the specified curvature is 2°, the superelevation is 6 inches, and the gage is 4 feet 8-1/2 inches. The distance between the center-lines of tracks No. 3 and No. 4 is 14 feet 3/4 inch.

Semi-automatic signal 16L, governing south-bound movements on track No. 3, is located 2,794 feet north of the point of accident. This signal is of the position-light type.

Rules of the Association of American Railroads governing the loading of machinery on open top cars read in part as follows:

Rule 1. Inspection * * * Cars must be inspected to see * * * that loads are properly and safely secured before being accepted from shippers. * * *

Rule 5. * * *

* * *

All cars * * * the load must be secured so as to prevent it from falling off car.

* * *

Machines and other items, having high center of gravity or narrow base, must be secured to prevent them from tipping over in transit.

The maximum authorized speed for the passenger train involved was 75 miles per hour, but it was restricted to 70 miles per hour on the curve on which the accident occurred.

Description of Accident

No. 143, a south-bound first-class passenger train, consisted of electric locomotive 4911, one baggage car, five coaches, one parlor car, one dining car, two coaches, and four sleeping cars, in the order named. All cars were of conventional all-steel construction except the last car, which was of lightweight steel construction. The second to the sixth cars, inclusive, and the eighth and ninth cars were equipped with tightlock couplers. This train passed signal 16L, which indicated Proceed, passed Gwynn, 3.5 miles south of Baltimore, the last open office, at 11:53 p. m., 2 minutes late, and while moving on track No. 3 at a speed of about 60 miles per hour it struck a piece of machinery which was obstructing the track. The locomotive, the first eight cars, and the front truck of the ninth car were derailed.

The locomotive stopped on its left side on tracks Nos. 2 and 3 and in line with them. The front end was 686 feet south of the point of accident. Separations occurred between the locomotive and the first car, between the fourth and fifth cars, and between the sixth and seventh cars. The coupler shank at the front end of the fifth car was broken. The first and second cars stopped in line with the locomotive. The first car leaned to the east at an angle of approximately 45 degrees. The third car stopped with the rear end between tracks Nos. 1 and 2. The fourth car stopped with the rear end on track No. 4. The fifth car stopped with the front end against the rear end of the fourth car and the rear end on track No. 2. The sixth car stopped with the rear end on track No. 4. The other derailed cars stopped approximately in line with track No. 3. The locomotive and the first eight cars were

considerably damaged, and the ninth car was slightly damaged. Track No. 3 was destroyed throughout a distance of about 700 feet immediately south of the point of accident.

The engineer, the fireman, the conductor, and three brakemen were injured.

The weather was clear at the time of the accident, which occurred about 11:53 p. m.

Electric locomotive 4911 is of the 4-6-6-4 type. The total weight is 477,000 pounds, distributed as follows: engine-truck wheels, 174,000 pounds; driving wheels, 303,000 pounds. The specified diameters of the engine-truck wheels and the driving wheels are, respectively, 36 inches and 57 inches. The rigid wheelbase of each driving truck is 13 feet 8 inches long, and the total wheelbase is 69 feet long. The total length of the locomotive is 79 feet 6 inches.

Discussion

As No. 143 was approaching the point where the accident occurred, the speed was about 60 miles per hour. The enginemen were in the control compartment of the locomotive, and the members of the train crew were in various locations in the cars of the train. The brakes of this train had been tested and had functioned properly when used en route. Both signal 16L and the cab signal indicated Proceed. The engineer first observed the obstruction on the track structure at a distance of about 50 feet. He thought the locomotive struck or passed the observation as he applied the brakes of the train. The fireman said that immediately before the accident occurred he was opening the window on the east side of the control compartment to inspect the train. He did not see the obstruction.

After the accident occurred an L-shape piece of machinery was found on its side about 1 foot west of the west rail of track No. 3. This piece of machinery was 7 feet 10 inches in length at the base, 7 feet 3-1/2 inches in height, and 1 foot 5 inches in width. It was painted with orange paint. There were many abrasions on the faces and corners of the piece of machinery.

Examination of the locomotive after the accident occurred disclosed that a portion of metal approximately 3/4 inch wide and 5 inches in length was torn from the front of the cover of the front roller-bearing journal box on

the west side of the rear engine truck. The metal was torn horizontally, and the bottom edge of the torn area was approximately 1 foot above the top of the rail. There were no other marks on the locomotive to indicate that it had been in contact with the piece of machinery. Examination of the first car disclosed that the inside equalizer on the west side of the front truck bore an indentation on the front edge approximately 2-1/2 inches above the bottom of the equalizer. Orange paint in the indentation indicated that the equalizer had struck the piece of machinery. Longitudinal rubbing marks on the bottoms of both equalizers on the west side of the truck indicated that the equalizers had been in contact with the piece of machinery. The marks extended from the front to approximately the centers of the equalizers. Heavy burn marks across the bottoms and at the rear of the four equalizers of the first truck indicated that the equalizers had been in contact with the rails. These marks indicate that the equalizers on the west side of the front truck overrode the piece of machinery and raised the truck sufficiently to derail the wheels of the truck.

The investigation disclosed that the piece of machinery which was struck by No. 143 had fallen from C.B. & Q. 89081, the sixty-seventh car of Extra 4742 South.

Extra 4742 South, a south-bound freight train, consisted of engine 4742, 80 cars, and a caboose. This train departed from Gwynn at 11:38 p. m., and was moving on track No. 4 at a speed of about 20 miles per hour when the piece of machinery fell to the track structure. The piece of machinery was struck by the rear truck of the sixty-eighth car and was thrown toward the west rail of track No. 3. The rear wheels of the rear truck of the sixty-eighth car were derailed as a result of the impact. The front wheels of this truck became derailed at a turnout 3,830 feet south of the point of initial derailment. At a point 1,340 feet south of the turnout a separation occurred between the sixty-seventh and the sixty-eighth cars, and the brakes of the train became applied in emergency. The train stopped about 11:42 p. m. with the rear end of the caboose 4,550 feet south of the point of accident. When the train stopped, the conductor and the flagman were in the caboose. They were not aware that the piece of machinery had fallen from the train. The flagman immediately proceeded northward to provide flag protection. When he reached a point approximately 300 feet north of the caboose, he observed flange marks of derailed wheels on the track structure. He called the conductor's attention to the flange marks, and the conductor

proceeded southward to inspect the train. The flagman again proceeded northward and called the operator at Gwynn from a telephone approximately 700 feet north of the rear of the caboose. The operator informed him that No. 143 had already passed and had stopped a short distance south of that station.

C.B. & Q. 89081 is a steel underframe flat car, built in 1938. Its light weight, nominal capacity, and maximum load limit are, respectively, 49,000 pounds, 100,000 pounds, and 120,000 pounds. The height of the car is 44-1/2 inches above the tops of the rails. It is provided with a wood floor. The length and width of the floor are, respectively, 55 feet 7 inches and 10 feet 4 inches. Stake pockets are provided on each side and on each end of the car. The stake pockets on the sides of the car are spaced approximately 3 feet apart, and those on the end are spaced approximately 2 feet 6 inches apart. The trucks are of the 4-wheel type and are provided with 33-inch cast iron wheels and 5-1/2-inch by 10-inch journals. The lading consisted of pulp machinery, and weighed 103,000 pounds. A skid 11 feet 10 inches long and 8 feet 7 inches wide was located on the floor at the north end of the car. The skid consisted of eight transverse pieces of 2-inch by 8-inch wood nailed on the top of three longitudinal pieces of 4-inch by 6-inch wood. Two of the longitudinal pieces constituted the sides of the skid. The other longitudinal piece was located at the center of the skid. Two transverse pieces were located adjacent to each other at each end of the skid. The other transverse pieces were spaced approximately 1 foot 3 inches apart. Each of the six northerly transverse pieces was further supported by a 4-inch by 6-inch block of wood located about 1 foot 5 inches from the east side of the skid. The end piece at the north end of the skid consisted of two pieces of 4-inch by 6-inch wood 9 feet 5 inches in length, secured together, one on top of the other. The end piece was placed lengthwise between the north end of the skid and two 4-inch by 6-inch stakes secured in the stake pockets at the north end of the car. The end piece was secured to the floor of the car with spikes. It was reinforced by five 2-inch by 8-inch pieces of wood 18 inches in length, spaced approximately equidistant from each other, and nailed to the floor with the longest dimension at right angles to the end piece. A 4-inch by 6-inch wedge-shape wood block 1 foot 1 inch in length was nailed to the top of each of the five pieces with the 4-inch by 6-inch surface against the end piece. An end piece also was provided at the south end of the skid. The west side of the skid was placed against four 4-inch by 6-inch stakes secured in stake pockets on the west side of the car. Blocks provided on the floor of the car extended

between the east side of the skid and four 4-inch by 6-inch stakes 6 feet in length secured in stake pockets on the east side of the car. Two pieces of machinery were loaded on the skid. One piece occupied approximately one-half the area of the skid at the south end and one-quarter of the area of the skid at the northwest corner. A smaller piece of machinery, which later fell from the car, occupied the northeast portion of the skid. The larger piece of machinery was secured against lateral movement on the skid by 2-inch by 4-inch wood cleats placed lengthwise against each side of the piece of machinery and nailed to the skid. It was secured on the south end by a 2-inch by 4-inch wood cleat placed lengthwise against the end of the piece of machinery and nailed to the skid. It was secured at the north end by a 2-inch by 6-inch wood cleat 4 feet in length placed between the end of the piece of machinery and the skid end-piece. This cleat was placed on the skid with the longest dimension against the north end of the piece of machinery and was nailed to the skid with five 20-penny nails. It was further secured from moving northward on the skid by a 2-inch by 6-inch wood cleat 2 feet in length placed between the south end of the smaller piece of machinery and a transverse, vertical surface of the larger piece of machinery. This cleat was placed on the skid with the longest dimension parallel to the sides of the car and was secured to the skid with five 20-penny nails. A 1-1/4-inch by 0.35-inch high-tension band extended transversely over the highest part of the piece of machinery. The ends of the band were secured to the east and west sides of the skid by metal brackets nailed to the skid. The length and width of the L-shape piece of machinery occupying the northeast portion of the skid were, respectively, 7 feet 10 inches, and 1 foot 5 inches. The height of the base was 2 feet 9-1/2 inches, and the maximum height of the piece was 7 feet 3-1/2 inches. It weighed 6,320 pounds. It was placed on the skid with the longer dimension of the base parallel to the sides of the car and the highest dimension of the piece to the south. The north end of the piece was approximately 2 feet 2 inches from the north end of the car, and the east side was approximately 1 foot 4 inches from the east side of the car. The west side of the piece was placed against the 2-inch by 4-inch cleat that secured the east side of the larger piece of machinery. The piece was secured at the north end by a 2-inch by 4-inch cleat placed between the end of the piece and the skid end-piece. This cleat was nailed to the skid. The piece was secured on the east side by 2-inch by 4-inch wood cleats placed lengthwise against the base, one near each end of the base. These cleats were nailed to the skid. A 4-inch by 4-inch wood brace was nailed at right angles to each of the three

stakes located in the stake pockets on the east side of the car adjacent to the piece of machinery. The braces were about 2 feet 6 inches above the floor of the car and extended between the stakes and the piece of machinery. The piece was held tightly against the braces by a 1-1/4-inch by .035-inch high-tension band which surrounded the piece and the stakes in a horizontal plane. The band was secured to the stakes by nails. A 1-1/4-inch by .035-inch high-tension band located about 1 foot from the north end of the piece of machinery extended transversely over the piece and a portion of the larger piece of machinery. The ends of the band were secured to the east and west sides of the skid by metal brackets nailed to the skid.

Examination of the car after the accident occurred disclosed that the skid had partially upset the end piece at the north end of the skid and had moved northward about one inch on the floor of the car. The cleat at the north end of the larger piece of machinery and the cleat between the smaller piece of machinery and the larger piece had become dislodged. The larger piece of machinery had moved northward about 3-1/2 inches on the skid. The smaller piece of machinery had fallen from the northeast portion of the skid. The northerly three stakes on the east side of the car were broken off flush with the floor of the car. The braces which had extended between these stakes and the east side of the piece were broken and dislodged from the stakes. The high-tension bands securing the piece to the skid and to the stakes were broken. Markings on the skid indicated that the piece had moved backward and forward on the skid a distance of 12 inches. Markings on the east side of the larger piece of machinery and on the stakes indicated that the smaller piece of machinery had swayed laterally. Examination of the other parts of the lading on the car disclosed no indications that the car was handled roughly en route.

The loading rules of the Association of American Railroads do not prescribe specific details for loading pieces of machinery similar to the piece which fell from the car, but require that such pieces be loaded in such manner that they cannot tip or fall from the car. In the instant case the stakes and the east side of the larger piece of machinery bore indications that the smaller piece of machinery had been rocking from side to side. This indicated that the bracing between the smaller piece and the stakes and the high-tension bands had not been adequate to prevent the smaller piece from tipping. Representatives of four lumber companies said that the stakes

which failed were of poor quality timber, and were not fit for securing the lading involved. After the failure of the bracing between the piece of machinery and the stakes and the failure of the high-tension bands, the piece of machinery was permitted to rock and strike against the upper portion of the stakes. This resulted in the failure of the stakes, and, without the protection afforded by the stakes, the piece of machinery fell from the car.

C.B. & Q. 89081 was loaded at the plant of the Improved Paper Machinery Corp. at Nashua, N. H., and was destined to Calhoun, Tenn., via the Boston and Maine, Delaware and Hudson, Pennsylvania, and Southern railroads. The car was inspected at the plant and was accepted by a car inspector of the Boston and Maine October 9. It was assembled in a train at Nashua and was moved southward to Mystic Junction, near Boston, Mass., where it was inspected and was shopped for a low coupler. The car was moved out of the shop October 12. It was assembled in a train and was moved westward to Mechanicville, N. Y., where it was delivered in interchange to the Delaware and Hudson October 13. It was inspected at Mechanicville and was accepted by Delaware and Hudson car inspectors. It was then assembled in a train and moved southward to Oneonta, N. Y., where it was inspected on arrival. It was assembled in a train at Oneonta and was moved southward to Wilkes Barre, Pa., where it was delivered in interchange to the Pennsylvania at Buttonwood Yard October 15. It was inspected at Buttonwood Yard and was accepted by Pennsylvania car inspectors. The car was then assembled in a train and moved southward to Enola, Pa., where it was inspected on arrival. It was assembled in Extra 4742 South at Enola October 17, and was inspected before departure.

None of the inspectors who inspected the car after it was loaded at Nashua took any exception to the method in which the lading was secured.

Cause

It is found that this accident was caused by an obstruction on the track.

Dated at Washington, D. C., this ninth day of November, 1953.

By the Commission, Commissioner Clarke,

(SEAL)

GEORGE W. LAIRD,
Secretary.